

What is claimed is:

1 1. A method for use in a mobile communications system having a plurality of  
2 cell segments, comprising:

3 communicating control and traffic signaling in a frame having a plurality  
4 of time slots in each cell segment, the time slots being time synchronized among the cell  
5 segments; and

6 transmitting control signaling in time slots adjacent time slots allocated as  
7 guard periods to protect the control signaling in a time slot of a first cell segment from  
8 interference by traffic signaling in another time slot of a neighboring cell segment.

1 2. The method of claim 1, wherein transmitting the control signaling includes  
2 transmitting the control signaling in every other time slot of each frame.

1 3. The method of claim 1, wherein communicating the control and traffic  
2 signaling includes communicating the control signaling in odd time slots of each frame.

1 4. The method of claim 1, wherein each time frame includes time slots 0, 1,  
2 2, 3, 4, 5, 6, and 7, and wherein the transmitting includes transmitting the control  
3 signaling in time slots 1, 3, and 5.

1 5. The method of claim 1, wherein each time frame includes time slots 0, 1,  
2 2, 3, 4, 5, 6, and 7, and wherein the transmitting includes transmitting the control  
3 signaling in time slots 1, 3, 5, and 7.

1 6. The method of claim 1, wherein transmitting the control signaling includes  
2 transmitting one of a synchronization burst and a frequency correction burst.

1 7. A method for use in a mobile communications system having a plurality of  
2 cell segments, comprising:

3 defining a plurality of channels and a frame having a plurality of time  
4 slots;

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5 providing a channel reuse pattern that is based on a plurality of channel  
6 frequencies and a plurality of time groups, wherein signaling is transmitted in different  
7 time slots of the frame in corresponding time groups; and  
8 providing predetermined time slots as guard periods to reduce likelihood  
9 of interference of signaling due to overlap of time slots in neighboring cell segments.

1 8. The method of claim 7, wherein providing time slots as guard periods  
2 includes setting the time slots to be idle.

1 9. The method of claim 7, wherein the defining includes defining a frame  
2 having eight time slots.

1 10. The method of claim 9, further comprising allocating control signaling to  
2 be carried in odd time slots of each frame.

1 11. A method for use in a mobile communications system, comprising:  
2 carrying control signaling in a multiframe that includes a plurality of  
3 frames, each frame including a plurality of time slots;  
4 communicating control signaling in predetermined time slots of  
5 predetermined frames; and  
6 communicating idle periods in time slots adjacent the predetermined time  
7 slots of the predetermined frames.

1 12. The method of claim 11, wherein each frame includes eight time slots, and  
2 wherein communicating the control signaling includes communicating the control  
3 signaling in odd time slots of the predetermined frames.

1 13. The method of claim 12, wherein communicating the idle periods includes  
2 communicating the idle periods in even time slots of the predetermined frames.

1           14.     The method of claim 13, wherein each frame includes time slots 0, 1, 2, 3,  
2     4, 5, 6, and 7, and wherein communicating the control signaling includes communicating  
3     the control signaling in time slots 1, 3, and 5, and communicating the idle periods  
4     includes communicating the idle periods in time slots 0, 2, and 4.

1           15.     The method of claim 13, wherein each frame includes time slots 0, 1, 2, 3,  
2     4, 5, 6, and 7, and wherein communicating the control signaling includes communicating  
3     the control signaling in time slots 1, 3, 5, and 7, and wherein communicating the idle  
4     periods includes communicating the idle periods in time slots 0, 2, 4, and 6.

1           16.     The method of claim 11, further comprising communicating traffic in at  
2     least some of the frames other than the predetermined frames.

1           17.     Apparatus for use in a mobile communications system having a plurality  
2     of cell segments, comprising:  
3                 an interface unit capable of communicating with the cell segments; and  
4                 a controller adapted to control communications of control and traffic  
5     signaling in a frame having a plurality of time slots in each cell segment, the time slots  
6     being synchronized among the cell segments, the controller further adapted to define  
7     guard periods each including at least one time slot to protect control signaling  
8     communicated in a time slot from interference due to overlap of time slots in neighboring  
9     cell segments.

1           18.     The apparatus of claim 17, wherein the controller is capable of  
2     communicating packet data between a data network and a mobile unit in one of the cell  
3     segments.

1           19.     The apparatus of claim 18, further comprising a second controller capable  
2     of communicating circuit-switched traffic between mobile units in the cell segments.

1           20.    The apparatus of claim 17, wherein the controller is adapted to define a  
2 channel reuse pattern based on frequencies and time groups, control signaling being  
3 carried in different time slots of the frame in corresponding time groups.

1           21.    A method for use in a mobile communications system having a plurality of  
2 cells each divided into three sectors, comprising:  
3                allocating a channel frequency to each cell sector;  
4                defining N time groups;  
5                defining a frame having eight time slots;  
6                providing an effective  $N/(3*N)$  channel reuse pattern that is based on the  
7 channel frequencies and the plurality of time groups, wherein signaling is carried in a  
8 different time slot of the frame in each time group; and  
9                allocating predetermined time slots in the frame as guard periods to reduce  
10 likelihood of interference of signaling due to overlap of time slots between neighboring  
11 cell sectors.

1           22.    A method for use in a mobile communications system having a plurality of  
2 cell segments, comprising:  
3                measuring control signaling carried in one or more of a plurality of time  
4 slots of a frame in a first cell segment and in a neighboring cell segment; and  
5                receiving control signaling in a first time slot adjacent a second time slot  
6 defined as part of a guard period to reduce likelihood of interference caused by overlap of  
7 time slots between the first cell segment and the neighboring cell segment.

1           23.    The method of claim 22, wherein the measuring includes measuring  
2 control signaling in time slots that are synchronized between the first and neighboring  
3 cell segments.

1           24.    A mobile unit for use in a mobile communications system, comprising:  
2                a transceiver to transmit and receive control and traffic signaling carried in  
3 frames each having a plurality of time slots; and

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